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Full Length Article

Understanding Knowledge Management System antecedents of performance impact: Extending the Task-technology Fit Model with intention to share knowledge construct

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Abstract

Little investigations have been made to examine the effect of employees' intention to share knowledge on Knowledge Management Systems' (KMS) use, lack of contribution from users has been listed as a failure factor for KMS. Researchers generally assess KMS by frequency of use, disregarding system impact on employees' performance, despite its impact on the system's long-term success. This paper contributes to KMS research by extending Task Technology Fit (TTF), a model which is widely employed to study KMS, with the intention to share knowledge construct, in investigating the determinants of KMS performance impact.

The paper starts with exploratory study, where interviews were conducted with a sample of KM users to explore possible constructs. In light of the interview results, a research hypothetical model was built integrating system and task characteristics constructs of TTF model. To validate the model, a survey was then conducted with 95 administration and technical staff of different managerial levels, for two different Knowledge Management Systems in two organizations. Intention to share knowledge, task characteristics, perceived Task Technology Fit, KMS characteristics, and utilization were found to have substantial influences on KMS performance impact. Among the key factors, intention to share knowledge was found to be especially important as it positively and significantly affects perceived Task Technology Fit, utilization, and KMS performance impact.

The suggested integrated model helps for better understanding of KMS from the perspective of users' motivation, system design, and tasks. This paper contributes-with academic and practical implications for KMS researchers, developers, and managers.

Keywords: Knowledge Management Systems (KMS); Task-Technology Fit (TTF); Intention to share knowledge; Performance impact; Utilization

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1. Introduction

Knowledge Management System is a system for applying and using knowledge management principles throughout a process to create, transfer, and apply knowledge in organizations (Dimitrijevic, 2014). Throughout KMS, organizations aim to effectively use the existing knowledge to create new knowledge and to take action, achieving sustainable competitive advantage from knowledge-based assets (Alavi & Leidner, 2001).

Considered as complex and multi-faceted systems, KMS research should be concerned about its different aspects, such as: individuals' knowledge contribution, organization structure and culture, fit between technology and tasks it supports, performance indicators, measurable benefits, and much more (Akhavan, Jafari, & Fathian, 2005; Frost, 2014). Nevertheless, much of the existing research on KMS focuses mainly on the potential role of IT (Alavi & Leidner, 2001). Most of KMS models end with utilization as an ultimate goal, neglecting the impact the system can achieve on employees' and organizations' performance. Consequently, some researchers indicate that due to shortage of research in these various aspects, KMS failure rate reached 50%, and that this percentage could be even higher if including all KMS that did not impact organizations up to their expectations (Akhavan et al., 2005; Anantatmula & Kanungo, 2010; Frost, 2014).

Among the diverse theories employed to investigate KMS utilization is Task-Technology Fit (TTF), which suggests that technology utilization is governed by the good fit between system's features and the requirements of the task. This paper goes beyond KMS utilization and investigates its performance impact on individuals in organizations. The paper integrates the individuals' knowledge sharing intention construct with the TTF constructs, to suggest a KMS utilization and performance impact model.

By suggesting and empirically validating this integrated model, the paper helps to understand KMS usage and performance impact from the perspective of organizational task, technology, and individual's intention to share knowledge. It also contributes to KMS research strand by providing academic and practical implications for implementers, managers and researchers.

2. Literature review/theoretical framework

2.1. Knowledge Management System

Knowledge is a vital asset and a significant resource of any organization; it conveys meaning and hence tends to be much more valuable, yet more ephemeral (Sharda, Delen, & Turban, 2014). Knowledge management contents typically focus on firm's strategic objectives such as innovation, improved performance, competitive advantage, as well as success stories and lessons learned. Hence, Knowledge Management Systems (KMS) can play a significant role in improving organizational and individual performance. Considered as the memory of the organization by leveraging the collective knowledge of the company from one project to another, substantial investments are done in technology infrastructure for KMS. Yet, little is known about return on investment for KMS, in terms of impact on employees and organization performance (Bock, Zmud, Kim, & Lee, 2005; Sharda et al., 2014).

KMS incorporates: create and capture new knowledge, support and facilitate content management, and share and re-use knowledge to generate value (Alavi & Leidner, 2001). Therefore, individual contributions, technology acting, and task structure are three of the main aspects of KMS (Frost, 2014). There is an increasing need within organizations to comprehend the antecedents of KMS usage and impact on employees' performance from the perspective of these various aspects (Goodhue, 1995; Alavi & Leidner, 2001; Akhavan et al., 2005).

2.2. Task Technology Fit Model (TTF)

The Task-Technology Fit Model (Goodhue, 1995) asserts that information technology should be a *good fit* with the tasks it supports, in order to be utilized and to positively affect users performance (Goodhue & Thompson, 1995). The model highlights the importance of the *fit* between information system features and users' tasks and needs, leading to performance impacts. Task-Technology Fit and performance impact are two important constructs which were missing or implicit in other IS adoption models.

The Task-Technology Fit Model provides insight on how technology, user tasks, and utilization impact user performance (Goodhue & Thompson, 1995). The TTF suggests that both, task characteristics and technology characteristics, affect user perception of Task Technology Fit, which in return influences the system's utilization and impact the user's performance.

2.3. TTF studies on KMS

Among theories employed to help understand factors influencing KMS is TTF. Using TTF, Ye and Johnson (1995) have shown that *Explanation Facilities*, offering comprehensive explanation and reasoning for advices provided by the KMS, encourage decision makers to use these advices, hence increase the system use and enhance user performance. With TTF model, Wixom and Todd (2005) have proposed that information *Accuracy* and *Accessibility* drive perceived usefulness, and hence drive system use in KM context.

TTF, however, ignores the personal cognition dimension, which has been found to affect the use of KMS, having user's contribution with knowledge as a main feature. Therefore, some research integrated the TTF with other models to provide more explanatory power than TTF alone. Dishaw and Strong (1999) used an integrated model, incorporating Davis' (1989) technology acceptance model (TAM) and TTF, to explore factors that explain KMS utilization. Wu, Chin and Lin (2007) integrated TAM with TTF to investigate determinants of systems acceptance. Kankanhalli, Tan and Wei (2005), suggested an integrated model between Ajzen's (1991) Theory of Planned Behavior (TPB) and TTF to investigate the potential antecedents to using of KMS for knowledge seeking.

In the current research, investigational interviews were conducted with a sample of users to mainly investigate the personal cognitive dimension of KMS, and also to determine other possible key factors. The aim is to extend the TTF with authentic personal dimension for better understanding of KMS usage and impact.

3. Research methodology

3.1. Research methodology

The main data collection technique in this research is survey, used to verify cause–effect relationships between the suggested model's variables within the context of KMS. Such quantitative method typically uses a deductive approach where the statistical significance of the results is generated from empirical analysis of data (Maykut & Morehouse, 1998). Coolican (2004) argues that a common drawback in such method is that it routinely reduces complex information to summary measures, ignoring authentic richness of individual behavior. On the other hand, qualitative data collated from users' interviews are treated in this research as investigational study to consolidate and enlighten mature research hypotheses and suggest hypothetical research model.

3.2. Investigational study: users' semi-structure interviews

Twelve volunteered users, who participated later in the survey, of two different KMS adopted in two organizations were interviewed around their experiences with the Knowledge Management System in their work place, reflecting their concerns, issues and motives to engage in using the system. Interviews began by asking what each KMS had contributed to the organization's knowledge management. This was followed by a few very general questions: what led the user to work with the KMS? What are the tasks implemented using the KMS? To what extend the KMS impacted how the user is doing the work? How much the user does contribute knowledge within the KMS? In essence, the interviews were very open-ended. Through analysis of the interviews scripts, ideas were organized into general conceptual themes. The themes capture a set of factors that the interviewees had consistently emphasized as an influence on their perception of usage of KMS and their knowledge sharing behaviors. Based on the interviews analysis, it can be suggested that users associated their use of KMS in their work place to some common factors, as following:

The employee's *Knowledge Sharing Intention* seems to be one of the most important issues, for 10 out of 12 of the participants. One interviewee quoted: "*This system is used by all departments in the firm. In the Monitoring & Evaluation unit, we add lots of materials to the system to share quarterly performance reports, evaluation newsletters and success stories…this helps our colleagues with their planning and budget and it highlights the work of our unit, and it also motivates us to use the system regularly*". An opposed view was expressed in an interview session: "*I usually use the company's KMS in one way, I rarely contribute with input, though many of my colleagues do. I can find all what I need there, why should I add more!*" Many of the comments extracted from the interviews focus on the feature of contributed input to KMS.

The *Timeliness* of the system seems to be one of the most important issues, for 10 out of 12 of the participants. As expressed by one of the employees: "*I depend on the KM in some tasks as it is designed to meet the deadline of my work schedule" such as Monday morning reports, as well as the weekly reports… Therefore, it helps me to be more productive*". A similar opinion was expressed in an interview session:" *The KM in my organization is tailored to our production schedule. Reports are generated at the exact needed time and I can easily access and print them…So I usually meet my deadlines"* Many similar comments were extracted from interviews, and all focus on the feature of KM for generating timely reports meeting the users' deadlines and matching the business process milestones. Participants stressed on the fact that this has a direct effect on their working performance.

The *Reliability* and *Accessibility* of the system seems to be also an important issue, for nine out of 12 of the participants. As expressed by one employee: "*I can count on KM more than any other system in the company… it is always up and rarely down like other systems we have… maybe because the CIO and CEO open it every day!!!..*". In the interview of this particular user, she expressed that since the KMS is one of the priorities for top management in her work place; the system is always reliable, and fast. On the other hand, a different quote expressed bad experience with KM in different work place as follows "*….The system in our workplace is slow… it crashes every time I add new title to the generated reports…often I receive unexpected error message and the system reboots….Consequently I often calculate the figures on Excel and do the reports on Word..*". Similar comments were extracted from interviews, focusing on the reliability and dependability of KMS.

The system's *Ease of Use* seems to be also an important issue, for seven out of 12 of the participants. Respondents have declared their hesitancy to engage in using any feature of the system which is not "*… easy in doing what I want to do…"* as expressed by an interviewee. The importance of ease of use is further more explored by the following opinion: "*Some features of the system are easy to do, others are not… for example it took me long time to learn how to use the financial decision report using Solver. Every time I need to generate this report I forget how to do it and this really wastes my time… While generating the weekly report, from the same system, is easy and straight forward… I always submit this report on time…"*. Similar comments were extracted from interviews, focusing on the importance of learnability, memorability and ease of use of the KM. This seems to be a deciding factor for most of the users to whether or not use the system, as it has a direct impact on their working performance.

The *Types of Business Tasks* impact, on a large extent, the perception of usefulness of the KM system, for more than the half of the targeted sample. "*..It depends on the task I need to accomplish…*" this was a common answer for most of interviewees, when asked about the use of KMS in their work place. Seven out of 12 of interviewees explained that for routine reports, for which data is available and straightforward they do not usually need to use the KMS. As for the non-routine reports which involve integrating data from other departments or different business functions, KMS is preferable. This issue was also supported by some quotes as following:"*…KMS is mainly used in our department for preparing quarterly reports which involved collecting data from all lines of business, while day-to-day tasks are usually done on Excel…*" "*For my regular and standard tasks I have my own reporting tools, as for ad-hoc reports that need data from the Intranet and/or other branches, I use the KMS*".

Few issues were also mentioned by a few number of employees, which did not seem to be common for the majority of the respondents, such as using KMS due to pressure from the top management, or to give the impression of being professional and technology oriented.

In summary, the findings of the investigational interviews indicate a number of factors that ~~seems~~ to be related to the use of the involved sample with the Knowledge Management Systems in their workplace.

First: knowledge sharing intention seem to be of high importance for 12 out of 12 of the participants.

Second: the technological characteristics of the system, such as its timeliness, reliability, accessibility, and ease of use, seem to be of high importance for at least 84% of the participants. These characteristics of the systems might be deciding factors to use the system or not. This is also reported to have high impact on the users' perceived usefulness of the system, as well as performance and effectiveness in the workplace.

Third: the characteristics of the task that needs to be accomplished, such as whether or not the task is a routine one, or requires integrated data from different entities. This seems to be of high importance for at least 63% of the participants. These characteristics of the task are suggested to be main factors for the system perceived usefulness and performance impact.

3.3. *Identifying research constructs and hypotheses*

This section discusses the research constructs and justifies relationships between them, based on results of the exploratory study of this research, and the previous work in the same field, where some of the exploratory results of this research were supported by relevant literature. While previous studies had relied upon survey data, similar findings have been obtained in this research, using different methods such as interviews. This provides a good justification to pursue further work in these findings, hence formulating the research hypothetical model.

All the items used by this research have been drawn from the literature, sharing a similar context to the current one, where they were quoted to be reliable and valid to measure constructs of the phenomenon that they intend to represent. All items were used in surveys and none of these items were modified by changing the wording of the item.

3.3.1. *Construct 1: task characteristics – TaskC*

Tasks are generally defined as the actions carried out by a user of a system in order to turn inputs into outputs (Fry & Slocum, 1984). Task characteristics of interest in the current research and as defined by TTF include those that might empower users to depend more into a great extent on certain aspects of the information technology (Goodhue and Thompson, 1995). Within the context of knowledge management application, studied in the current research, an example of task characteristic can be the user information need to answer questions concerning various organization operations. This would enforce the user to depend heavily on the KMS capacity to process queries using operational information data bases.

The construct is designed to measure two aspects of task characteristics: the *non-routineness* of tasks and the *interdependence* of tasks using five items adopted from Goodhue (1995). The items investigate whether or not the user deals with ill-defined, ad-hoc, non-routine and unexpected business tasks. The items also ask about whether or not the user's tasks involve more than one business function. The task characteristics items were tested in a study validating the TTF using a survey method for over 600 individuals in two companies using transaction processing system. The five items were reported as reliable measures for task characteristics construct, with a Cronbach's Alpha equals 0.76 (Goodhue & Thompson, 1995).

3.3.2. *Construct 2: technology characteristics – TechC*

Technologies, in the context of information systems, are computer systems components which assist user in carrying out needed tasks. Such components include, but not limited to: Software, hardware, network, data bases, interface, training, technical support. Technology characteristics of interest in the current research and as defined by TTF focus on the underlying characteristics of the technology of information system used by each respondent. In each of the two organizations considered in this research, a single Knowledge Management System is adopted. An assumption was set that the characteristics of each of the KMS are the same for all users using that system (Goodhue & Thompson, 1995). A dummy variable was used where 1 indicates use to a specific system and 0 indicates no use. Setting this assumption and dummy variable allowed differentiate between the two KM with different characteristics without defining these differences (Goodhue & Thompson, 1995).

3.3.3. *Construct 3: Task-Technology Fit – TTF*

Task-Technology Fit, in the context of information systems, is defined as the degree to which system can support users in performing needed tasks; TTF aims to widen the gap between the requirements of a task and the features of technologies (Goodhue & Thompson, 1995). Within the context of knowledge management application, studied in the current research, an example of Task-Technology Fit can be the integrated databases with all corporate data to be available and accessed to all authorized users.

The construct is designed to measure seven aspects of technology characteristics. First: the authorization provided by the system using two items, investigating whether or not the user has authority to access useful data, and whether getting this authorization is easy and timely. Second: compatibility of the system using two items, investigating whether or not the equivalent data acquired from other system is inconsistent, or defined differently. Third: reliability of the system using three items, investigating whether or not the user can count on the system to be up and available when needed and whether or not the system is subject to frequent problems or/and inconvenient down times. Forth: timeliness of the system using two items, investigating whether or not system report delivery meets deadlines, and are completed on time. Fifth: ease of use of the system using two items, investigating the learnability and comprehensibility of the system. Sixth: training, measured using two items investigating timely training opportunities for users. Seventh: technical support provided to the user by the IS team, measured by ten items investigating the IS team understanding of the business process, dedication, responsiveness, planning, and performance. The Task-Technology Fit items were tested in a Goodhue and Thompson (1995) study, reported above, validating the TTF using a survey method and they were reported as reliable measures for Task-Technology Fit construct, with a Cronbach's Alpha ranging from 0.60 to 0.88.

3.3.4. Construct 4: utilization – UT

Utilization is the behavior of employing the technology towards completing needed tasks. Utilization have been widely measured in many IS adoption model through the binary decision of use/no-use, the frequency of using a system, and for how long the system is used (Davis, 1989). The TTF Model refines the conceptualization of the construct to consider the proportion between the decision to use and the number of tasks need to be accomplished (Goodhue, 1995).

The construct is designed to measure one aspect of utilization which is the proportion of times the individual decided to use the system with consideration of the number of tasks the user needs to accomplish. This is calculated by making the sum of the decisions to use divided by the number of tasks (Goodhue & Thompson, 1995).

3.3.5. Construct 5: performance impact – PI

Performance impact in the information systems context refers to the accomplishment of set of tasks by an individual with improved efficiency and higher quality. Performance impact of systems has been rarely measured, or even though of, in IS adoption models, though this might be one of the main objectives of an information system, to improve users' efficiency of doing tasks involved. According to Goodhue (1995), high TTF would increase not only the users' likelihood of utilizing a system, but also would boost the performance impact of the system on the user, as it more directly meets the user's task needs.

The construct is designed to measure one aspect of performance impact which is the users' self-report on the perceived impact of the system on performance in their job. Two items were used to measure the construct investigate whether or not the system positively impact the users' effectiveness and performance in their jobs. The two items were reported as reliable measures for task characteristics construct, with a Cronbach's Alpha equals 0.61 (Goodhue & Thompson, 1995).

3.3.6. Construct 6: knowledge sharing intention – KSI

Knowledge sharing intention in an organization refers to the willingness of employees to share with others the knowledge they have gained or created (Gibbert & Krause, 2002). The sharing could be done within KMS either via communications between individuals or via knowledge archive. Knowledge sharing intention has been rarely measured in KMS literature, even though it is considered to be the most sever challenge facing the organizations desiring to increase KMS usage (Bock et al., 2005).

The construct is designed to measure two aspects of knowledge sharing intention which are the intention to share explicit knowledge and intention to share implicit knowledge. Two items were used to measure the first aspect by investigating whether or not the employee is willing to share work reports, manuals, and models with work colleagues. The two items were reported as reliable measures for KSI construct, with a Cronbach's Alpha equals 0.92 (Bock et al., 2005). The second aspect: intention to share implicit knowledge was measured using three items investigating whether or not the employee is willing to share expertize and knowhow gained from training and education with work colleagues. The three items were reported as reliable measures for KSI construct, with a Cronbach's Alpha equals 0.93 (Bock et al., 2005).

Hypotheses 1–3:

Task characteristics and technology characteristics ► Task-Technology Fit ► utilization

The exploratory interviews of this research suggest that task and technology characteristics are main issues for the targeted sample when interacting with knowledge management. The interviews textual analysis suggests that the type of tasks they are required to accomplish and the technological tools of the system are key criteria for the sample in their perception of quality for the KMS, and consequently their willingness to use the system. Technology characteristics, in particular, scored the highest (for 84% of participants) as being deciding factor in perceiving quality and usefulness and suggesting utilization of the KMS, while 63% of participants give similar importance for task characteristics. This suggests that task characteristics and technology characteristics could have a strong impact on user perception for the degree to which the system can assist in performing the needed tasks. This impact is suggested to encourage utilization of the system. Such impact is worth further investigation, and it is therefore logical to consider task and technology characteristics as main constructs of the current research, and to hypothesize that they are antecedents of Task-Technology Fit, which is in return suggested to be an antecedent to system utilization.

On the other hand, the effect of Task-Technology Fit as antecedents of system's utilization has infrequently been emphasized in the information system context, though other antecedents are widely researched, such as user attitude, satisfaction, beliefs, along with social norms (Davis, 1989; Gefen & Straub, 2003, El Said & Galal- Edeen, 2009). A smaller number of researchers have argued that when a system provides support that *fits* the requirements of a needed task; this would be a strong predictor of systems use (Floyd, 1988). This research is exploring this relationship by hypothesizing a positive significant effect of the Task-Technology Fit perception in supporting utilization decision for an information system.

Hypothesis 1. For the knowledge management users, the system's perceived Task-Technology Fit will be significantly affected by task characteristics.

Hypothesis 2. For the knowledge management users, the system's perceived Task-Technology Fit will be significantly affected by technology characteristics.

Hypothesis 3. For the knowledge management users, the system's utilization will be significantly affected by the perceived Task-Technology Fit.

Hypotheses 4 and 5:

Task-Technology Tit and utilization ► Performance impact

The exploratory interviews of this research suggest that the task and technology characteristics of Knowledge Management Systems affect to a large extent their performance at work. For a high percentage of interviewees, the ultimate aim for using KMS is to improve their work efficiency. The interviews textual analysis suggests that the success of KM to meet their task requirements, leading for their willingness to use the system, is believed to directly affect their work performance, as expressed in the following quotes: "*it helps me to be more productive", "it helps me to meet my deadlines*" "*..I always submit this report on time…*" Such impact is worth further investigation, and it is therefore logical to hypothesize that TTF and utilization are antecedents of perceived performance impact.

Previous research looking at *fit* of the information system with needed tasks, suggested a direct impact of this *fit* on user performance (Benbasat & Barki, 2007). This relationship between *cognitive fit* and user performance was also validated in laboratory experiment (Vessey, 1991). On the other hand, studies looked at mismatches between system's features, in term of data representation and the required tasks; suggest that this mismatch would slow decision making performance (Vessey, 1991).

Based on the previous discussion, this research hypothesizes that both, Task-Technology Fit and utilization for knowledge management applications would have a significant impact on user performance, as stated in the following hypotheses:

Hypothesis 4. For the knowledge management users, the perceived performance impact will be significantly affected by Task Technology Fit perception of the system.

Hypothesis 5. For the knowledge management users, the perceived performance impact will be significantly affected by the utilization of the system.

Hypotheses 6–8:

Knowledge sharing intention ► Task-Technology Fit

Knowledge sharing intention ► Utilization

Knowledge sharing intention ► Performance impact

The exploratory interviews study of this research suggests that user's intention to share knowledge is a main issue for the targeted sample when interacting with Knowledge Management System. The interviews textual analysis suggests that the willingness to share knowledge is a key criterion for the sample in their perception of quality for the KM system, and consequently their willingness to use the system. Willingness to share knowledge scored the highest as being deciding factor in perceiving quality and usefulness and suggesting utilization of the KM system. On the other hand, the effect of knowledge sharing intention has been emphasized in investigating organizational culture (Gibbert & Krause, 2002; Bock et al., 2005). These studies suggested that the willingness to share explicit knowledge (work reports and official documents), as well as the willingness to share implicit knowledge (expertize and knowhow gained by the employee's self-professional development and education) are considered the most sever challenges facing organizations aiming to establish knowledge-sharing behavior as organization's culture. Such challenge is worth further investigation, and it is therefore logical to consider knowledge sharing intention as a main construct of the current research. Based on the previous discussion, this research hypothesizes that knowledge sharing intention of users positively affect perception of Task-Technology Fit, utilization, and performance impact of KMS, as postulated in the following hypotheses:

Hypothesis 6. *For the knowledge management users, the system's perceived Task-Technology Fit will be significantly affected by the knowledge sharing intention of the user.*

Hypothesis 7. For the knowledge management users, the system's utilization will be significantly affected by the knowledge sharing intention of the user.

Hypothesis 8. For the knowledge management users, the system's performance impact will be significantly affected by the knowledge sharing intention of the user.

3.4. Hypothetical research model

The process of designing the hypothetical model of this research is discussed in the previous section and the model is illustrated in Fig. 1 in terms of dependent and independent constructs.

The model hypothesizes that Knowledge Management System's perceived task characteristics and technology characteristics have significant effect on user's perception of Task-Technology Tit, which in return would significantly affect system's utilization. Knowledge sharing intention is expected to affect both Task-Technology Tit and utilization. It is also hypothesizes that user's performance impacts is significantly affected by Task-Technology Tit, utilization, and knowledge sharing intention.

3.5. The sample

The sampling method in this study is based on convenience sampling technique (Krathwohl, 1997). Participation in the study was voluntary. The sample size depended on the number of volunteers who were willing to participate in the experiment. The sample includes administration and technical staff with different managerial levels and business functional domains outside the MIS department (secretaries, engineers, middle level managers, human resources

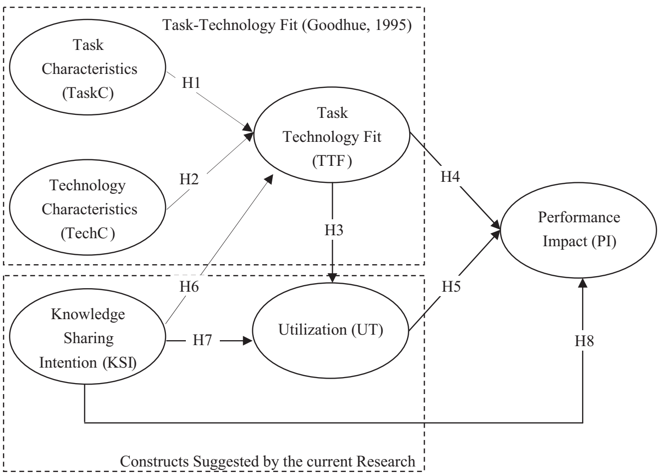

Fig. 1. Hypothetical research model for KMS performance impact.

coordinators, and public relations) who use the organization-based implemented Knowledge Management System in their business tasks. Major effort was done to randomly select participants from each business domain. Participants were from two large organizations with different in a range of industries (construction and financial services). All participants are permanent staff, working in their organizations for at least two years. They all own a university degree in different disciplines, and within the age range of 27–50 years. All participants show either intermediate or high technology familiarity, working with their organization's Knowledge Management System for at least 6 months. Males represent 46% of the sample and females represent 54% of the overall sample. Table 1 illustrates the demographic characteristics of the sample. Altogether 150 surveys were distributed in the two organizations, and 95 usable replies were received back, representing about 63% of the total sent out.

4. Results and discussions

4.1. Constructs and items validity and reliability

All measures in this research were adopted from previous research, where they were reported to be valid and reliable for the constructs they are measuring. Meanwhile, the investigational study, adopted in this research, supports research validity and reliability through the use of multiple methods of measures (Janesick, 2000). Nevertheless, survey items were coded, each survey was given a unique number, and each survey item was given a code. Data were entered into SPSS. The frequency and range of each variable were assessed. Outliers resulting from data entry were corrected by revisiting the original questionnaire. No cases with missing values were found.

Table 1
Demographic characteristics of the sample.

Demographic variable	Count (percentage) $N=95$
Gender	
Male	44 (46%)
Female	51 (54%)
Education	
Bachelor	76 (80%)
Master	18 (19%)
PhD.	1 (1%)
Age	
25-30	33 (35%)
31-40	43 (45%)
41–50	19 (20%)
Work experience	
2 years	19 (20%)
3–5 years	28 (29%)
6–10 years	29 (31%)
11–15 years	19 (20%)
Work experience with the KMS	
6 months	9 (10%)
6 months–1 year	29 (30%)
2–3 years	43 (45%)
4–6 years	14 (15%)
Position in organization	
Middle level manager	24 (25%)
Human resources staff	19 (20%)
Public relations staff	14 (15%)
Secretary	14 (15%)
Engineers	24 (25%)
Industry	
Construction	52 (55%)
Financial services	43 (45%)

Items correlations were computed, and each item was found to be correlated more highly with other items measuring the same construct than with other items measuring other constructs, as evidence of discriminant validity (Keil et al., 2000). Validity check was done for each construct separately using Inter-Consistency between items measuring this construct. All items were found highly significant valid, having the Sig. (2-tailed) equals.000 and Pearson Correlation near 1. According to the Inter-Consistency analysis of all research constructs, all items were found highly significant or significant valid, owing a Sig. (2-tailed) equals.000 and a Pearson Correlation between .87 and .78, except the items measuring the utilization construct which were found equals.72.

Constructs reliability was checked using Cronbach's Alpha measure. All constructs had composite reliability scores above 0.8 and had average variance extracted scores exceeding 0.5 and Cronbach's Alpha exceeding 0.6, this suggests that all constructs had adequate reliability. While construct validity was measured using the correlation coefficient between each variable and its associated items using Pearson Correlation Coefficient (Krathwohl, 1997). A significant correlation was found between all variables and all their associate items.

4.2. Model testing

The current research employs Structural Equation Modelling (SEM) technique to validate the TTF Model. SEM models relationships among multiple independent and dependent constructs simultaneously instead of measuring only one layer of linkages between independent and dependent variables at a time. The model analysis of this research is mainly based Partial least squares (PLS) as the statistical method, confirming models through the values of: R^2, Path coefficients, and T-Value.

The value of R^2 represents the percentage with which the independent variables explain the variation in the dependent variable. According to PLS analysis, the value of R^2 is highest in PI followed by TTF, and finally by UT. This suggests that the model mainly provides explanation of the variation of performance impact on the largest degree, followed by explanation of the variation of Task-Technology Fit, on a less degree, and finally explanation of the variation of the utilization of KMS applications on the lowest degree. Furthermore, the KSI ► PI path, the TTF ► PI path, and the UT ► PI path, are particularly valid, where they explain 70% of the variation in PI. Followed by the paths of KSI ► TTF, TechC ► TTF, and KSI ► TaskC where they explain 50% of variation in TTF. This again suggests the strength of model in explaining mainly the variation of the PI and TTF constructs, more than the third dependent construct, the UT. It also highlights the effect of Knowledge sharing intention of explaining a relatively high percentage of the performance impact and the Task-Technology Fit variation. The effect of Task-Technology Fit, as well as utilization, also explains the variation of the performance impact but with a smaller percentage. While no significant effect of TTF was suggested on UT.

T-Values in PLS is calculated through Bootstrap technique, where support for each hypothesis is assessed by examining the sign and statistical significance of the T-Value for its corresponding path, where the accepted T-Value is 2.326 with a significance level of 0.01. Table 2 shows the path coefficients and T-Values for research hypotheses. The supported hypotheses are marked in bold. The results shows that KSI, TaskC and TechC both have significant positive effect on TTF ($t=7.7420$, $p<0.01$, $t=3.1504$, $p<0.01$, and $t=3.0727$, $p<0.01$ respectively). This suggests that the knowledge sharing intention, task characteristics, and technology characteristics of a KMS directly affect the user's TTF perception for that system, hence, H1, H2, and H6 are supported. On the contrary, no significant

Table 2
Path coefficient (p), T-Value, and R^2 of hypotheses.

Structural Model Path	Path coefficient (p)	T-Value	R^2
TaskC→TTF	0.256	3.1504*	0.501
TechC→TTF	0.238	3.0727*	
KSI→TTF	0.378	7.7420*	
TTF→ UT	0.009	1. 443	0.301
KSI→UT	0.246	5.8558*	
TTF→PI	0.246	5.8558*	0.703
UT→PI	0.514	3.751*	
KSI→PI	0.575	15.2666*	

*Acceptable T-Value > 2.326 with a significance level $p < 0.01$.

effect was found for TTF on UT, having *T*-Value less than 2; hence H3 is not supported. This unexpected result suggests that the high user's perception for the Task-Technology Fit of the system could not guarantee the system use. On the other hand, a significant effect was found for KSI on UT; hence H7 is supported. This finding suggest that while in the context of the current research, knowledge sharing intention has a positive significant effect in KMS utilization, Task-Technology Fit does not seem to have this significant effect.

The results also propose that KSI, TTF and UT have positive effect on PI ($t=15.2666$, $p<0.01$, $t=5.8558$, $p<0.01$ and $t=3.751$, $p<0.01$ respectively), with various degrees. The stronger the knowledge sharing intention is the higher is performance impact on the largest degree; hence H8 is supported. Furthermore, the more Task-Technology Fit is the higher is performance impact, but on a less degree; thus H4 is supported. And finally, the frequent the utilization is the higher is performance impact, but on the lowest degree; hence H5 is supported.

4.3. Summary of results

Antecedents of KMS usage and impact are of major concern to the MIS community. Task Technology Fit (TTF) is among the various theories engaged to help understand this, where the good fit between technological characteristics and task characteristics is needed as a major factor determining usage (Lin & Huang, 2008). TTF, however, ignores the personal cognition dimension, which has been suggested to affect the use of KMS (Bock et al., 2005; Lin & Huang, 2008; Frost, 2014). To overcome this TTF limitation, some KMS research integrated it with Davis' (1989) TAM, others with Ajzen's (1991) TPB, to provide more explanatory power by considering users' major cognitive forces (Wu, Chen, & Lin, 2007; Kankanhalli et al., 2005; Dishaw & Strong, 1999). Nevertheless, none of these models deals directly with the users' perception of sharing knowledge whereas user's contribution with knowledge is a main feature of KMS.

This paper suggests a KMS model that integrates the TTF constructs with the KMS users' knowledge sharing intension construct; the latter was suggested by the investigational interviews in the current research, also introduced by previous research as a main antecedent of KMS success (Gibbert & Krause, 2002; Bock et al., 2005; Frost, 2014).

The model suggested by this paper supports a significant positive effect of employees' knowledge sharing intention on KMS Task-Technology Fit. Additionally, knowledge sharing intention was found to be positively and significantly affecting the system's usage, and positively and significantly affecting impact on employees' performance in work place. This particular finding highlights a main antecedent of KMS usage and impact which is rarely considered in other KMS models; Even so, lack of willingness to contribute is listed on the top of KMS failure factors (Weber 2007; Frost, 2014). In the following sub section of this paper, implications are offered to KMS practitioners, implementers, and researchers, for further consideration of this important construct in KMS context.

The suggested model also provides supportive evidence that both, the task characteristics and technology characteristics significantly affect the user perception of Task-Technology Fit construct, which is in return significantly impact KMS impact on user performance. Utilization was also found to be affecting performance impact. These findings support similar previous studies validating TTF in KMS context (Goodhue, 1995; Goodhue & Thompson, 1995; Ye &d Johnson, 1995; Wixom & Todd, 2005).

Nevertheless the relationship between Task-Technology Fit and utilization was not strongly validated, at least for the target sample and target KMS of the current study. Although the effect of task and technology characteristics on utilization was supported through the qualitative analysis of the interviews, this was not the case in quantitative analysis of the survey. However, there is a strong body of literature supporting the relationship between perceived usefulness and utilization (Davis, 1989; Benbasat & Barki, 2007; El Said, 2014). This suggests that at least under some conditions, which did not exist in the current research, the relationship between Task-Technology Fit and utilization is valid (Goodhue, 1995). A reason for this unexpected result might be that this research measures the utilization construct through a self-reported measure, where the sum of times the individual reported using the system is divided by the number of tasks performed. Though that some limitations are associated with self-reported measures, it would seems appropriate to work on defining objective measures for utilization, possibly by constructing an experiential laboratory environment.

5. Conclusion and implications

Previous research on KMS has focused mainly of discussion of general and usage principles (Nevo & Chan, 2007; Skok & Kalmanovitch, 2005); with little exploration of the user's contribution to the system contents (Bock et al., 2005). Research on KMS intention to share knowledge and performance impact hence offers a distinctly additional perspective to provide a richer understanding of KMS. A good fit between KMS characteristics and the tasks they support increases the impact of the system on users' performance. Users by willing to contribute and share their own knowledge on KMS, positively influence the system usage and impact. Organizations establishing KMS have to ensure the good fit between task and technology, and to institutionalize knowledge sharing culture within work contexts. Future studies would extend the model suggested by this research to examine KMS usage and impact beyond the boundaries of single organizations and across different knowledge assets and cultures.

5.1. Research contribution with academic and practical implications

While some studies indicate that KM initiatives often resulted to outright failure due to some factors, mainly lack of users' contributions and lack of measurable benefits of KMS (Akhavan et al., 2005); Investigations are needed to understand these factors and provide recommendations for operating environments.

This study is adding to the body of academic knowledge in the field of assessment of Knowledge Management Systems (KMS). Most of KMS research focuses on usage, with a shortage of literature looking at performance indicators and measurable impact benefits. Furthermore, most of previous research neglected the fact that user's contribution is what mainly distinguishes KMS from any other IS. This research extends the Task-Technology Fit (TTF) model with the knowledge sharing intention construct. This integrated model explains about 70% of the variance in KMS performance impact, with acceptable validity and reliability.

Based on this research results, practical implications can be suggested to KMS practitioners, implementers, and managers, such as:

- As knowledge sharing intention was found as an antecedent of KMS usage and performance impact; managers can build a culture of knowledge sharing in workplace by encouraging opportunities for employees' interpersonal interactions through brainstorming meetings, focus groups, and social relationships. Praising individual's contributions to the organization knowledge and providing appropriate feedback to employees' engagement in knowledge sharing, would strengthen the culture of knowledge sharing. This would not happen if individual's expertize is rewarded while mentoring others is not (Bock et al., 2005). Managers would also prevent that organization knowledge be linked to specific people or job functions, or place more value on individual genius rather than collective work.
- As Task-Technology Fit was found as an antecedent of performance impact, user involvement in analysis and design phase of systems is crucial. By bringing their understanding of the business process and task characteristics, this would more likely result in successful KMS implementation and ensure that the resulting system would fit the task need. Managers would ensure aligning KM characteristics to the overall organizational goals. They have to ensure that the system issues knowledge that is useful, relevant, and contextual to the tasks implemented by users.

5.2. Limitations

In this research, two different KMS, implemented in two different organizations were included, where differences between the two systems were ignored. While, KMS characteristic is a main construct in the research model, different KMS features might cause different users' perception. The current research did not deal with these differences. Additionally, the model was tested based on volunteer employees' self-administered survey, which might introduce bias, affecting the validity of measurements. On the other hand, a sample larger than the 95 employees included in this research would add more strength to the validation of the research model.

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